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13. ABSTRACT (Maximum 200 words)

For the reported period the researchers focused on several problems on the propagation of electromagnetic and acoustic waves in periodic and disordered media. (1) Localization properties of some discrete models for light, (2) Existence of gaps and exponential localization for the Anderson type models for periodic and disordered acoustic dielectric media and (3) Band-gap structure for periodic two component dielectric and acoustic media.

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FINAL TECHNICAL REPORT  
on the research project  
"Localization Phenomenon in Some  
Random Classical Systems"

A. Figotin

July 20, 1994

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For the reported period I focused on several problems on the propagation of electromagnetic and acoustic waves in periodic and disordered media.

- Localization properties of some discrete models for light, [1,2]
- Existence of gaps and exponential localization for the Anderson type models for periodic and disordered acoustic and dielectric media, [3,6,7]
- Band-gap structure for periodic two component dielectric and acoustic media, [4,5,8]

The detailed information on the work done was presented in the annual reports as well as copies of the papers and preprints which have been already sent to the Air Force Office of Scientific Research.

## Papers Published and Submitted

- [1] *The Localization Properties of a Random Steady Flow on a Lattice*, Journal of Statistical Physics, **66**, 1599-1612, 1992
- [2] *One Model of a Nonhomogeneous Medium Conducting Light*, Journal of Statistical Physics, **69**, 969-993, 1992.
- [3] *Existence of Gaps in the Spectrum of Periodic Structures on a Lattice*, Journal of Statistical Physics, **73**, 571-585 , 1993.
- [4] *Band-Gap Structure of the Spectrum of Periodic Maxwell Operator*, Journal of Statistical Physics, **74**, 447-455, 1994 (with P. Kuchment)
- [5] *Photonic Psuedogaps for Periodic Dielectric Structures*, Journal of Statistical Physics, **74**, 433-446, 1994
- [6] *Localizaation Phenomenon in Gaps of the Spectrum of Random Lattice Operaators*, Journal of Statistical Physics, **75**, 997-1021, 1994 (with A. Klein)
- [7] *Localizaation of Electromagnetic and Acoustic Waves in Random Media. Lattice Model*, Journal of Statistical Physics, **76**, 885-1003, 1994 (with A. Klein)
- [8] *Band-Gap Structure of the Spectrum of Periodic Dielectric and Acoustic Media. I. Scalar model*, (submitted), 1994 (with P. Kuchment)